SERIAL _____

INSTRUCTION MANUAL

SD351
RANGE EXTENDER
(FOR SD350-6)

PART NO. 27913500

V00483

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H/S Memory Schematic, A2	279145
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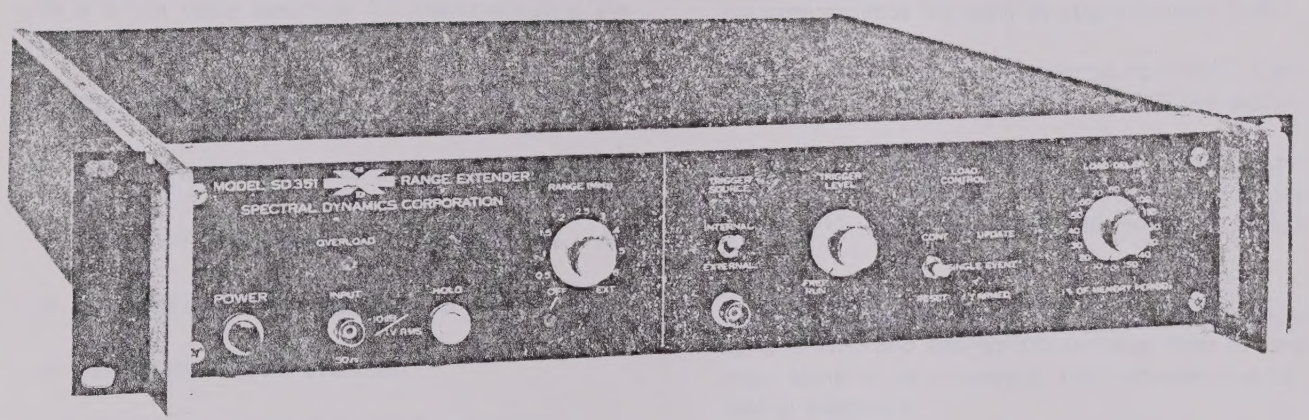
Power Supply Schematic, PS1	279444



Model SD351 Range Extender

SECTION I

GENERAL INFORMATION

1.1 INTRODUCTION

The SD351 Range Extender is designed for use with the SD350-6 series Digital Signal Analyzer. Its purpose is to enhance the utility of the SD350-6 by extending the frequency range of the input analog signal to 6 MHz. The SD351 also provides a convenient interface for 12-bit high speed digital data from an external source to the SD350-6. Figure 1-1 is a Simplified Block Diagram of the Range Extender. The Range Extender is designed for mounting in a standard 19-inch rack and is provided with a 6-foot cable assembly for interconnecting the SD351 and SD350-6.

1.2 CHARACTERISTICS

The following features are provided by the SD351.

a. Selectable anti-alias filter in 9 ranges.

b. Internal or external trigger selection.

c. Indication of 3 dB overload.

d. Hold/load control of SD350-6 and SD351.

e. External frequency range control for external digital data source and SD351.

f. Continuous or single-event transfer of memory data.

g. Digital to analog conversion for monitoring analog form of transferred data.

1.3 FRONT PANEL FUNCTIONAL DESCRIPTION

Figure 1-2 is a front view of the Range Extender Model SD351. The front panel controls and indicators provide the following operational functions.

POWER Pushbutton/Indicator — Applies primary power to PS1. Illuminated when ON. (See paragraph 1.4 for description of POWER input connector.)

OVERLOAD Indicator — Illuminates when input signal level exceeds full scale by approximately 3 dB.

INPUT Connector — Analog signal input BNC. Connected in parallel with rear panel INPUT connector.

HOLD Pushbutton/Indicator — Inhibits master clock, signal sampling, A/D conversion, and data transfer to SD350-6. Illuminated when in HOLD state.

RANGE (MHz) Selector — Selects frequency range up to 6 MHz and appropriate anti-alias filter for the input signal to be processed. Also provides the following selections:

OFF: Places the Range Extender in an inactive state. However, if the SD350-6 RANGE (Hz) selector is in EXT, external range control of the SD350-6 is available through the RANGE CODE pins of the external control connector J2.

EXT: Provides for external control of the RANGE (MHz) selector through the RANGE SELECT pins of the external control connector J2.

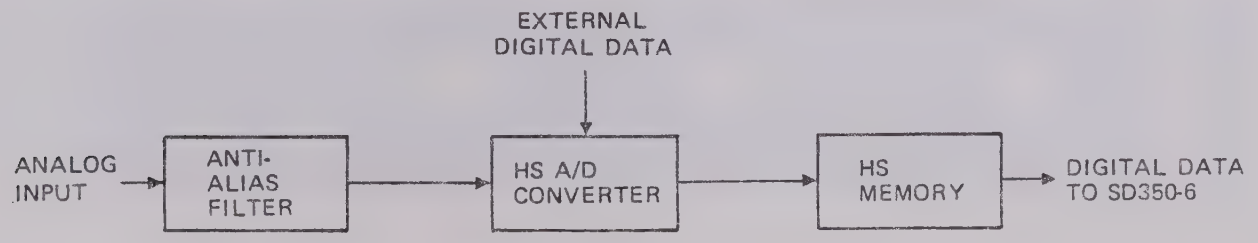


Figure 1-1. Model SD351 Simplified Block Diagram.

RANGE (MHz) OFF Indicator — Indicates that the Range Extender is not active. Illuminated when the RANGE (MHz) selector is in OFF or when the SD350-6 RANGE (Hz) selector is not in EXT.

TRIGGER SOURCE Selector/Connector — Selects the trigger source from either the output of the anti-alias filter (INTERNAL) or from an EXTERNAL source connected to the BNC. The connector is in parallel with rear panel TRIG connector.

TRIGGER LEVEL Control — Determines the signal level of the TRIGGER SOURCE necessary to generate the trigger pulse required to transfer data to the SD350-6. When in the FREE RUN detent, data transfer occurs at a constant rate determined by TRANSFORM SIZE and selected RANGE.

LOAD CONTROL Mode Selector — Determines the mode of memory loading and data transfer from memory to the SD350-6 as follows:

CONT: Continuous mode provides for automatic continuous transfer of data blocks when TRIGGER LEVEL is in FREE RUN detent or when transfer is initiated by a trigger pulse following completion of previous data block transfer.

SINGLE EVENT: Limits transfer of data to one data block.

RESET: Rearms the unit after a SINGLE EVENT data transfer.

UPDATE Indicator — Flashes to signal each transfer of a data block.

ARMED Indicator — Illuminates when the memory is loaded with a block of data and is ready for transfer.

LOAD DELAY (% OF MEMORY PERIOD) Selector — determines the time delay, as a percent of memory period, between the trigger pulse and the transfer of a data block to the SD350-6. At 0% delay, the trigger will be at the end of the data block so that data transfer will be instantaneous. At 150% delay, the trigger will start a delay time-out such that data transfer will occur after a delay of 1-1/2 times the memory period.

1.4 REAR PANEL FUNCTIONAL DESCRIPTION

Figure 1-3 shows the rear view of the Range Extender. The rear panel holds the unit's interconnecting and power connectors.

J1, J2 Connectors — Provides interconnect facilities between the Range Extender and the SD350-6 Analyzer and if applicable, an external control and digital data source. See tables 1-1 and 1-2 for pinouts.

INPUT Connector — Analog signal input BNC. Connected in parallel with front panel INPUT connector

TRIG Connector — External trigger BNC. Connected in parallel with front panel TRIGGER SOURCE EXTERNAL connector.

X Connector — BNC which provides positive TTL pulse during data block transfer.

Y Connector — BNC which provides D/A converted output of data block transferred to SD350-6.

Z Connector — No connection reserved for future use.

POWER Connector — Primary power input connector and fused filter. (See paragraph 1.3 for description of POWER pushbutton/indicator.)

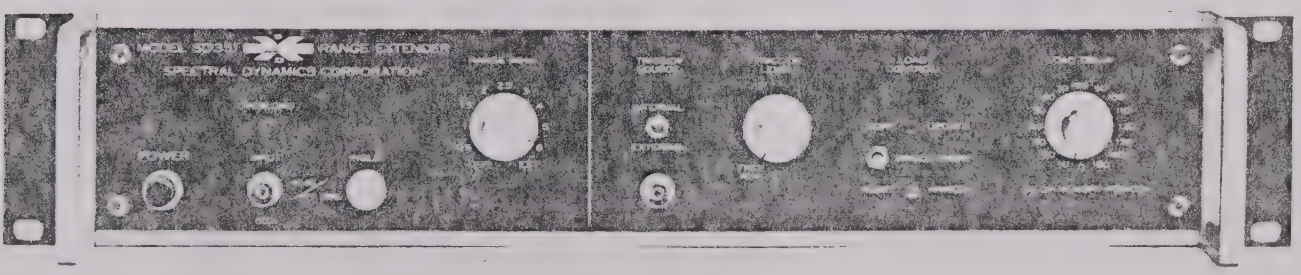


Figure 1-2. Model SD351 Front Panel View.

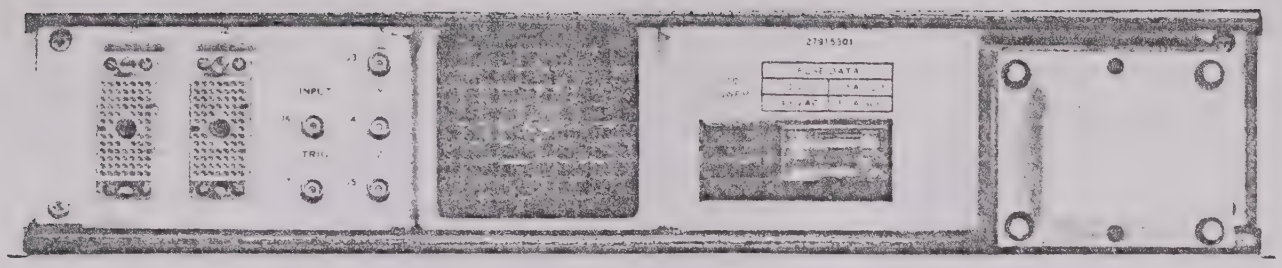


Figure 1-3. Model SD351 Rear Panel View.

1.5 SPECIFICATIONS

Input, Analog;
- Frequency Range, Internal: . . 0.5 MHz steps to 3 MHz, 1 MHz steps from 3 MHz to 6 MHz
- Frequency Range, External: 10 MHz
- Impedance . . . 50 ohm shunted by 100 pF
- Full Scale: . . . . 316 mVrms (−10 dB/1 Vrms)
- A/D Converter: 8-bit

Input, Digital: . . . 12-bit TTL level

Output: . . . . . 12-bit "Real Data" 12-bit "Imaginary Data"

Transient Capture;
- Load Delay: . . Zero % to 150% of memory period
- Trigger: . External, Internal, or Free-running

Two-tone Dynamic Range and Noise Floor . 55 dB from full scale

Harmonic Distortion* 48 dB from full scale

(distortion effect of the input A/D — these terms reflect about the sampling frequency)

Power: . . 115/230 Vac, 50-60 Hz, 50W

Dimensions;
- Height . . . 8.9 cm (3.5 inches)
- Width . . . 48.3 cm (19 inches)
- Depth: . . . . 48.9 cm (19.25 inches)
- Weight: . . 9.07 kg (20 pounds)

Table 1-1. Analyzer Interface Connector J1, Pinouts

Pin	Function	Pin	Function
1A	SB (MSB) OUT DATA, REAL	1J	WEIGHTING MODE
2A	B1 OUT DATA, REAL	2J	C SUBCYCLE
3A	B2 OUT DATA, REAL	6J	RNG (Hz) R × 4
4A	B3 OUT DATA, REAL	7J	RNG (Hz) R × 16
5A	B4 OUT DATA, REAL	1K	TRN (1J)
6A	B5 OUT DATA, REAL	2K	RTN (2J)
7A	B6 OUT DATA, REAL	3K	RNG (Hz) R × 1
1B	RTN (1A)	5K	RNG (Hz) R × 2
2B	RTN (2A)	6K	RNG (Hz) R × 8
3B	RTN (3A)	7K	RNG (Hz) C × 250
4B	RTN (4A)	2L	SB (MSB) OUT DATA, IMAG
5B	RTN (5A)	3L	B1 OUT DATA, IMAG
6B	RTN (6A)	4L	B2 OUT DATA, IMAG
7B	RTN (7A)	5L	B3 OUT DATA, IMAG
1C	DGTL GND	6L	B4 OUT DATA, IMAG
2C	B7 OUT DATA, REAL	7L	B5 OUT DATA, IMAG
3C	B8 OUT DATA, REAL	1M	DGTL GND
4C	B9 OUT DATA, REAL	2M	RTN (2L)
5C	B10 OUT DATA, REAL	3M	RTN (3L)
6C	B11 (LSB) OUT DATA, REAL	4M	RTN (4L)
7C	XFORM A	5M	RTN (5L)
2D	RTN (2C)	6M	RTN (6L)
3D	RTN (3C)	7M	RTN (7L)
4D	RTN (4C)	1N	B6 OUT DATA, IMAG
5D	RTN (5C)	2N	B7 OUT DATA, IMAG
6D	RTN (6C)	3N	B8 OUT DATA, IMAG
7D	XFORM B	4N	B9 OUT DATA, IMAG
1E	LOAD INP (SD350) MEM	5N	B10 OUT DATA, IMAG
2E	EXT DGTL DATA SEL	6N	B11 (LSB) OUT DATA, IMAG
3E	SD351 ENBL (SD350 EXT)	7N	XFORM C
5E	SD351 OFF	1P	RTN (1N)
6E	EXT HOLD IN	2P	RTN (2N)
7E	RTN (7F)	3P	RTN (3N)
1F	RTN (1E)	4P	RTN (4N)
2F	RNG (Hz) C × 10	5P	RTN (5N)
6F	EXT HOLD OUT	6P	RTN (6N)
7F	A/D OUT DSBL	7P	EXT SAMP SEL OUT
1H	GND		

Table 1-2. External Control and Digital Data Input Connector J2, Pinouts

Pin	Function	Pin	Function
1A	SB (MSB) EXT DGTL DATA	6D	RTN (6C)
2A	B1 EXT DGTL DATA	7D	XFORM B
3A	B2 EXT DGTL DATA	1E	EXT LOAD
4A	B3 EXT DGTL DATA	2E	EXT DGTL DATA SEL
5A	B4 EXT DGTL DATA	5E	SD351 OFF
6A	B4 EXT DGTL DATA	6E	EXT HOLD IN
7A	B6 EXT DGTL DATA	7E	EXT SAMP SEL
1B	RTN (1A)	1F	RTN (1E)
2B	RTN (2A)	2F	RNG (Hz) C × 10
3B	RTN (3A)	6F	EXT HOLD OUT
4B	RTN (4A)	1J	RNG SEL A
5B	RTN (5A)	2J	RNG SEL B
6B	RTN (6A)	6J	RNG (Hz) R × 4
7B	RTN (7A)	7J	RNG (Hz) R × 16
1C	DGTL GND	1K	RNG SEL C
2C	B7 EXT DGTL DATA	2K	RNG SEL D
3C	B8 EXT DGTL DATA	3K	RNG (Hz) R × 1
4C	B9 EXT DGTL DATA	5K	RNG (Hz) R × 2
5C	B10 EXT DGTL DATA	6K	RNG (Hz) R × 8
6C	B11 (LSB) EXT DGTL DATA	7K	RNG (Hz) C × 250
7C	XFORM A	2L	TTL TRIG
2D	RTN (2C)	4L	EXT SAMP CLK
3D	RTN (3C)	2M	RTN (2L)
4D	RTN (4C)	4M	RTN (4L)
5D	RTN (5C)	7N	XFORM C

SECTION II

OPERATION

2.1 GENERAL

This section provides instruction on the interconnection and operation procedure of the SD351 Range Extender. It is recommended that the operator become familiar with these procedures before operating the instrument. The operator must also be familiar with the applicable operating procedures of the Digital Signal Analyzer SD350-6.

2.2 INTERCONNECT

The SD351 Range Extender is designed to operate with the SD350-6 series Digital Signal Analyzer. It accepts analog signals and converts them to digital data for routing to the SD350-6 for analysis. (It can also accept 12-bit digital data from an optional external source for processing and routing to the SD350-6.) Figure 2-1 shows the interconnection required for the Range Extender, the Digital Signal Analyzer, and the input signals. See Tables 1-1 and 1-2 for the pin location of the circuit functions between the equipments.

2.3 OPERATION

2.3.1 Preliminary

Before applying power to the Range Extender, check that the POWER connector assembly is properly aligned and fused for the line voltage to be used. The operating voltage selection will show in the window of the POWER connector. Select the connector alignment as follows:

a. With power cord disconnected, open fuse cover.

b. Rotate fuse-pull to left.

c. Select line voltage alignment (orient PCB with desired voltage reading on top, left side).

d. Push PCB into module slot.

e. Rotate fuse-pull back into normal position.

f. Install corresponding fuse into holder.

g. Close fuse cover and connect power cord.

2.3.2 Power-up

Apply primary POWER to the Range Extender (indicator illuminated), and operate the SD350-6 according to its operating procedures. (The SD350-6 RANGE (Hz) selector must be in the EXT mode in order for data to transfer from the Range Extender to the SD350-6.)

2.3.3 Operation Setup

a. Connect the analog signal to be analyzed to the INPUT connector on either the front panel or rear panel.

b. Check HOLD mode disabled (indicator extinguished)

c. Set RANGE (MHz) selector to the position that includes the highest frequency to be analyzed. For external control (external digital data source connector), set RANGE (MHz) to EXT.

d. If applicable, connect the external trigger source to either the front panel or rear panel trigger connector.

e. Select the INTERNAL or EXTERNAL trigger as required.

f. Set TRIGGER LEVEL as required for trigger pulse to initiate a load delay time-out, or select FREE RUN for constant rate of data transfer as determined by SD350-6.

g. Set LOAD CONTROL to CONT (continuous) for triggered or continuous rate (FREE RUN) transfer of data blocks, or set LOAD CONTROL to SINGLE EVENT for transfer of one data block when the LOAD CONTROL is ARMED. After a SINGLE EVENT transfer, the SD351 is ARMED by depressing the LOAD CONTROL to RESET.

h. When in a trigger mode, select the desired LOAD DELAY. At 0% delay, the preceding memory period (as defined by the SD350 transform size) worth of data is transferred instantaneously with the trigger pulse: at 150% delay, it occurs after a delay of 1-1/2 times the memory period.

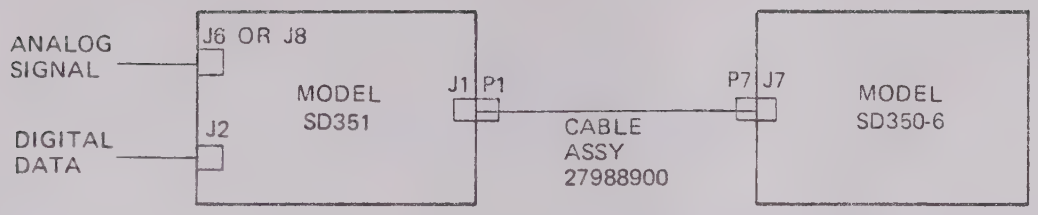


Figure 2-1. SD351 Interconnect Diagram.

SECTION III

CONCEPT OF OPERATION

3.1 GENERAL

The SD351 Range Extender accepts an analog input signal of up to 6 MHz and converts it into a digital form suitable for input to the SD350-6 series Digital Signal Analyzer. It also provides an interface for the digital data of an external source to be routed to the SD350-6. This section describes, in signal flow sequence, the functional operation of the Range Extender. See Figure 3-1.

3.2 FUNCTIONAL DESCRIPTION

3.2.1 Anti-Alias Filter

The Anti-alias Filter provides frequency range selection and anti-alias filtering for the analog input signal. The front panel and rear panel INPUT BNC's are parallel connected so that the input signal may be front or rear panel connected. The input impedance is 50 ohms resistance shunted by a maximum of 100 pF capacitance. Full scale input is 316 mVrms (−10 dB/1 Vrms). Input signal levels as high as 20 dB (3.16 Vrms) above full scale will not damage the SD351, but clipping will cause spurious signals. The analog input is AC coupled and has a corner frequency of 100 Hz. The filter bank consists of 9 anti-aliasing filters. The filter selection is front panel controlled or, when in the EXT position, is determined by an external source. The RANGE (MHz) control (or external source) establishes a binary code which, when decoded, selects the appropriate filter. See Table 3-1. The filtered signal is then buffer-amplified for output to the A/D converter.

3.2.2 HS A/D Converter.

The A/D Converter assembly converts the analog output of the Anti-alias Filter to the digital form necessary for input to the SD350-6. The filtered analog input is amplified and routed to an 8-bit, fully parallel converter. The analog signal is also used as the INTERNAL trigger source to generate the trigger pulse which initiates LOAD DELAY time-out. (See paragraph 3.2.3 for a description of the LOAD DELAY). An alternative trigger source (EXTERNAL) is provided through parallel connected front or rear panel BNC's.

The trigger generator is controlled by the Trigger Level Switch Control. When the control is turned fully counterclockwise to the detent, the SD351 is in the Free Run Mode. In this mode, data transfer to the SD350-6 occurs at a constant rate and is not triggered by the trigger source signal. When the control is out of the detent the SD351 is in the triggered or transient capture mode. The trigger generator will produce a pulse whenever the trigger source signal exceeds an amplitude positive or negative, selected by the trigger Level Control. The counterclockwise end of the control range selects a 0-volt level. Moving the control clockwise increases the level to approximately 5 volts, plus and minus, required for triggering. The output of the trigger generator initiates LOAD DELAY time-out.

The range decoder uses the range select input to generate the range code sent to the SD350-6 and the range input to the Sample Rate Selector. The sample rate selector combines master oscillator, hold and range inputs to produce the clock pulses tailored to the frequency range of the signal under investigation. These clock-pulses are routed to the 8-bit A/D converter and to the H/S Memory Assembly.

The Hold Detector senses the presence of a nold signal and sends a signal to the Sample Rate Selector. This signal disables the master clock pulses in the SD351 and halts all signal sampling, A/D conversion and data transfer. The transition into or out of the Hold state is synchronized with the SD350-6 weighting signal. Therefore, transition only occurs when an FFT computation is complete. If the front panel OFF indicator is dark, placing the SD351 into Hold will also place the SD350-6 into HOLD. However, SD350-6 hold does not control the SD351.

The A/D converter assembly also contains a D/A converter. The digital data, which is transferred to the SD350-6, is reconstructed by this D/A converter, is buffered, and may be monitored in analog form by connecting an oscilloscope to J4 on the rear panel.

The overload detector produces an output to light the OVERLOAD indicator when the input signal reaches the limit which the A/D converter can accurately convert. The overload occurs at 3 dB above full scale or ±600 mV peak. The LED indicator is kept lighted by a

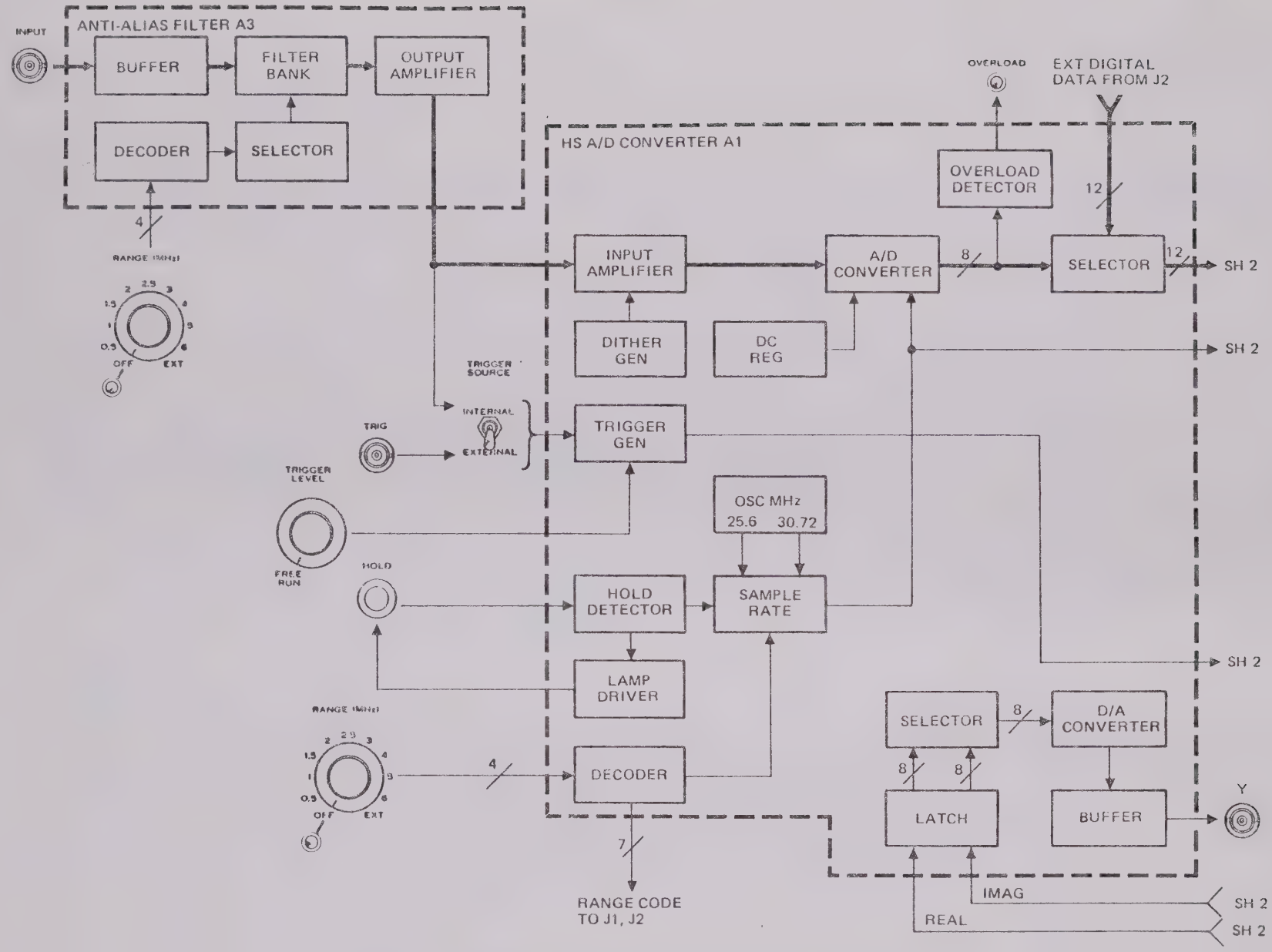


Figure 3-1. SD351 Functional Block Diagram (Sheet 1 of 2).

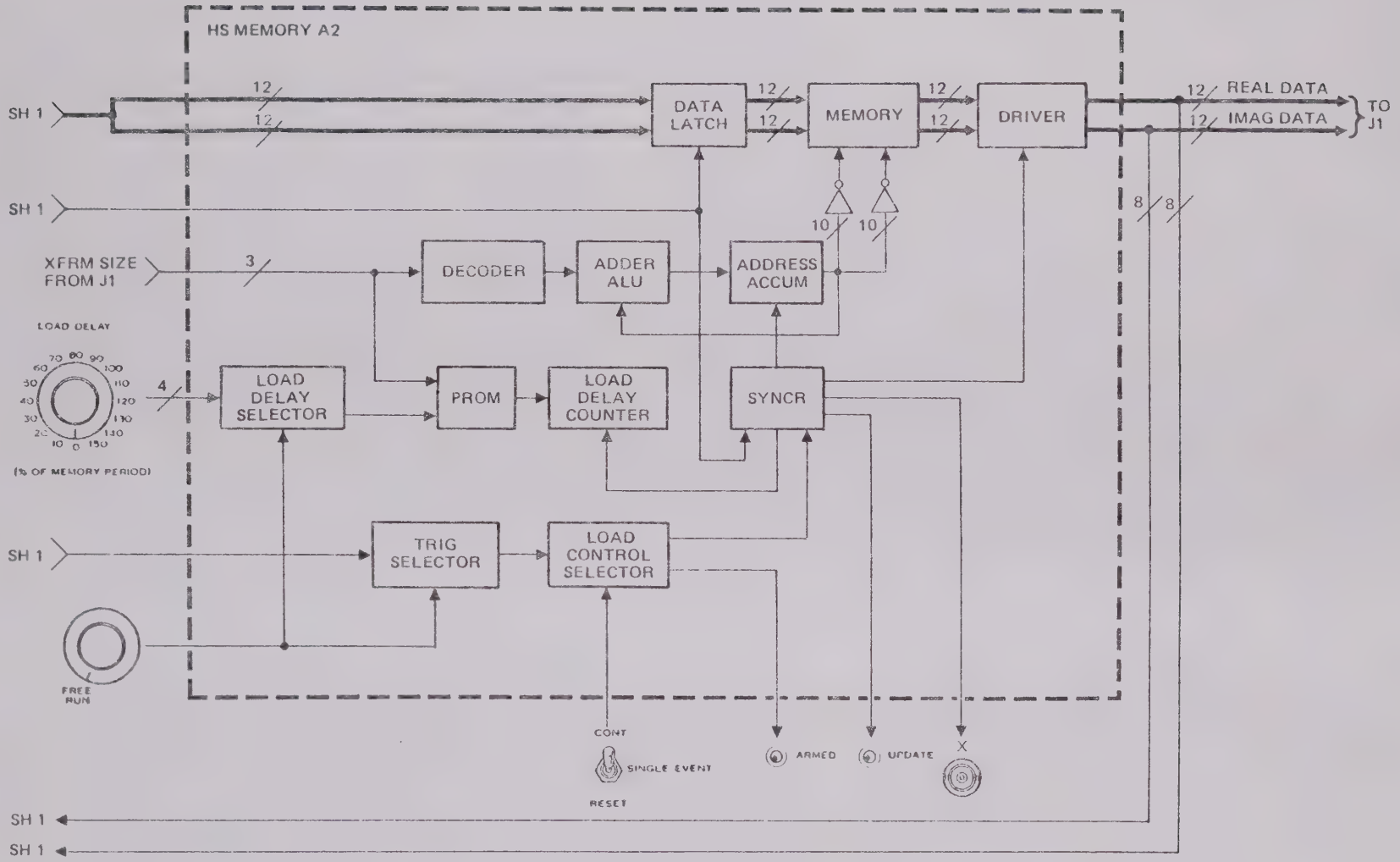


Figure 3-1. SD351 Functional Block Diagram (Sheet 2 of 2).

Table 3-1. Frequency Range Selector

Range (MHz)	Code			
	D	C	B	A
OFF	1	1	1	1
0.5	0	0	0	0
1	0	0	0	1
1.5	0	0	1	0
2	0	0	1	1
2.5	0	1	0	0
3	0	1	0	1
4	0	1	1	1
5	1	0	0	1
6	1	0	1	1
EXT	(Received from external source)			

one-shot multivibrator, so that even short duration overloads will be indicated. The external Digital Data is routed to the A/D converter assembly. The data is applied to a selection matrix from where it is made available to the memory assembly for further processing.

3.2.3 H/S Memory

The High speed memory assembly contains the memory circuitry of the SD351 where both real and imaginary digital data are stored prior to transfer to the SD350-6. The memory assembly receives Data inputs, Transform size inputs, Trigger inputs, Load Control input and Load Delay selection inputs.

The load control switch has three positions. These positions are CONTINUOUS, SINGLE EVENT and RESET. The RESET position is momentary. The switch is spring loaded to return to single event position. With the LOAD CONTROL switch in the CONT position, and with the SD351 in Free Run Mode, blocks of data are sent to the SD350-6 at a continuous rate depending on the transform size and range selected. With the SD351 in Triggered or Free-Run Modes, a new data block transfer is initiated whenever a trigger occurs following completion of a previous block transfer. A data block consists of "N" contiguous samples of the input signal where "N" is the transform size selected.

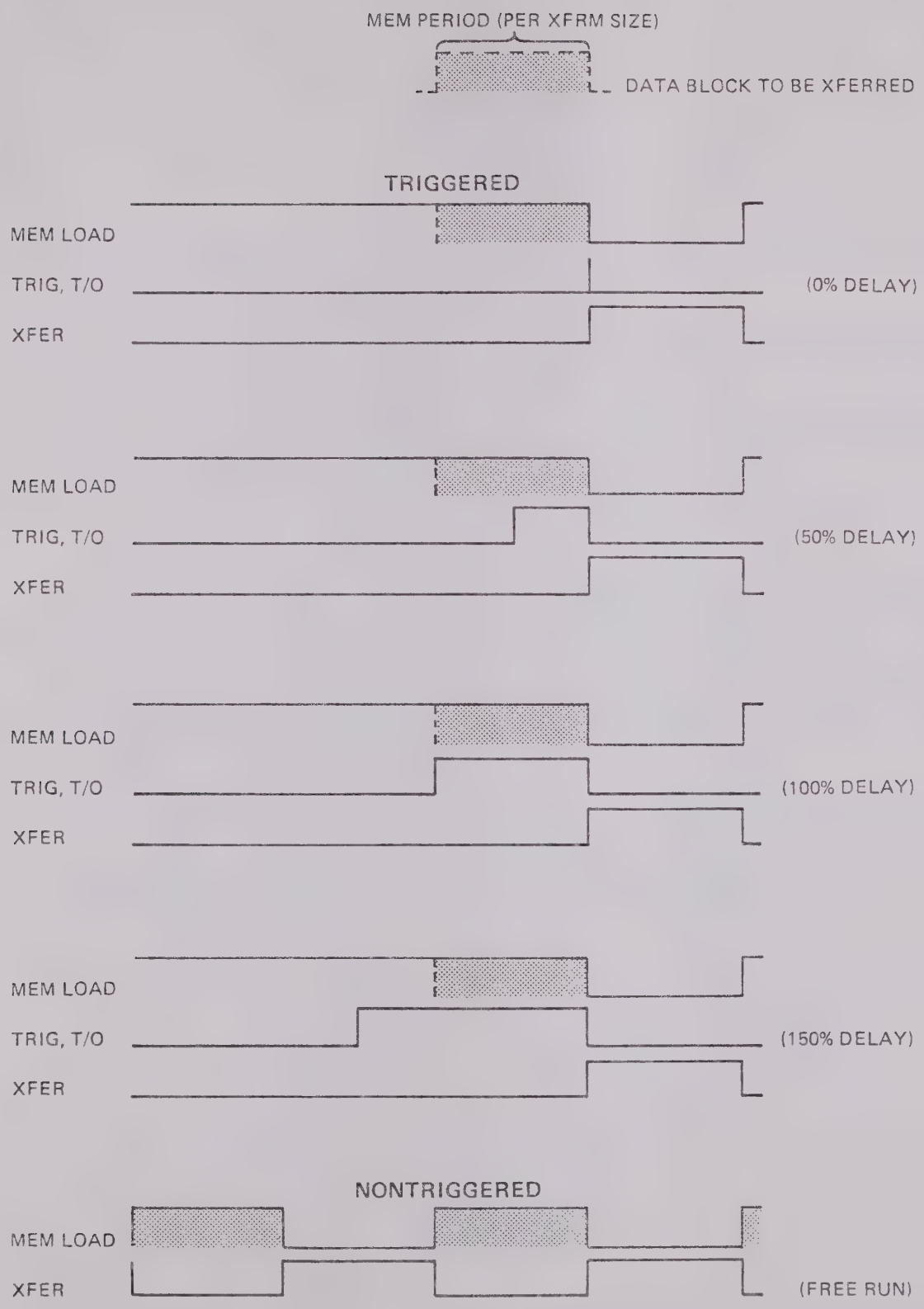
The update LED will flash red each time a data block transfer occurs. With the load control switch in the single event position and when the SD351 is armed, Green LED lighted, transfer of one data block to the SD350-6 will occur automatically in the Free-Run Mode or a single transfer is accomplished when a trigger occurs in the triggered mode. In the single event position, data transfer disarms the SD351. The SD351 is armed by depressing the Load Control Switch to RESET.

The trigger generator output from the A/D converter assembly is combined with the output of the trigger level control in a trigger selector on the memory assembly. The trigger selector feeds the load control selector which is controlled by the LOAD CONTROL switch. The output of the load control selector is a signal to the Synchronizer and an armed indication.

The Synchronizer performs three timing functions. These functions are Load memory, Read memory and Load Delay. Thus the transfer of data from the A/D converter through the selector, in and out of memory is dependent upon inputs to the Synchronizer of sample rate and load control. Transform size is applied through a decoder and an adder to the address accumulator where with the Sync pulse it controls the loading of memory.

The transform size is combined in a programmed read only memory with the load delay signal from the Load Delay Selector. The inputs to the Load Delay Selector are trigger level and load delay. Load delay is a percentage of the memory period and is selectable from 0 to 150% of the memory period. The memory period is the time required to take N samples of the input signal, where N is the transform size. That is, the memory period is the time required to accumulate one data-block of samples. When the SD351 is active, memory is continuously being filled with data samples. When a trigger occurs the load delay timeout starts. When the timeout is complete, memory filling is interrupted and contents of memory are transferred. When the transfer is complete, filling of memory resumes. Triggering cannot again occur before a complete new data block is accumulated in the memory. Refer to Figure 3-2. In the free run mode, data is transferred as soon as the SD350-6 is ready to accept a new block of data. In the triggered mode, if the Load Delay Switch is set to 0% delay the trigger will occur at the end of the data block of samples. At 50% delay, the trigger will occur in the middle of the block of data samples. At 100% delay, the trigger will occur at the beginning of the data block of samples. At 150% delay, the trigger will occur one-half a memory period before data blocks begin to be accumulated. The load delay counter receives a signal from the PROM and counts down the selected delay period. Upon the count completion the synchronizer triggers the driver to transfer data from memory.

The synchronizer also supplies a pulse to J3 on the rear panel for external use with test equipment.



NOTE: MEMORY PERIOD VARIES DIRECTLY AS TRANSFORM SIZE

Figure 3-2. LOAD DELAY Timing.

SECTION IV

MAINTENANCE

4.1 GENERAL

Maintenance procedures for the SD351 Range Extender are limited to the replacement of malfunctioning assemblies or certain chassis components. Because of the design simplicity and limited functional demands of the Range Extender, no attempt is made in this manual to provide specific troubleshooting or calibration procedures. The simplified and functional block diagrams (Figures 1-1 and 3-1) will assist in isolating failures to the printed circuit assembly level. Interconnect drawings, schematic diagrams, and assembly drawings of the printed circuit cards are provided at the rear of this manual.

CAUTION

Do not remove slide covers while power is connected to the unit.

Access to the chassis components and printed circuit assemblies is obtained by removing the top and bottom slide covers. This is accomplished by removing the four corner screws and sliding the cover out toward the rear of the unit. To remove the printed circuit assemblies, remove the top cover and proceed as follows:

a. Free the card cage for pivoting by loosening the two 1/4-turn fasteners (see Figure 4-1).

b. Pivot the card cage up to the service position.

c. Disconnect ribbon cable at header connector, J11.

d. Disconnect coaxial splice connectors between printed circuit assemblies and chassis.

e. Lift extractor tabs of printed circuit assembly to be removed, and pull assembly clear of card guides.

4.2 REPLACEABLE PARTS AND ASSEMBLIES

All repair parts for the SD351 Range Extender may be ordered directly from Spectral Dynamics Corporation. However, except for some specification – controlled parts which must be ordered from Spectral, standard electronic parts have been used throughout the instrument. Table 4-1 provides a list of replaceable assemblies and chassis components.

When ordering a replacement part or assembly, be sure to include the reference designation, manufacturer's and/or Spectral Dynamics' part number, and a complete description, including the instrument name, model number, and serial number.

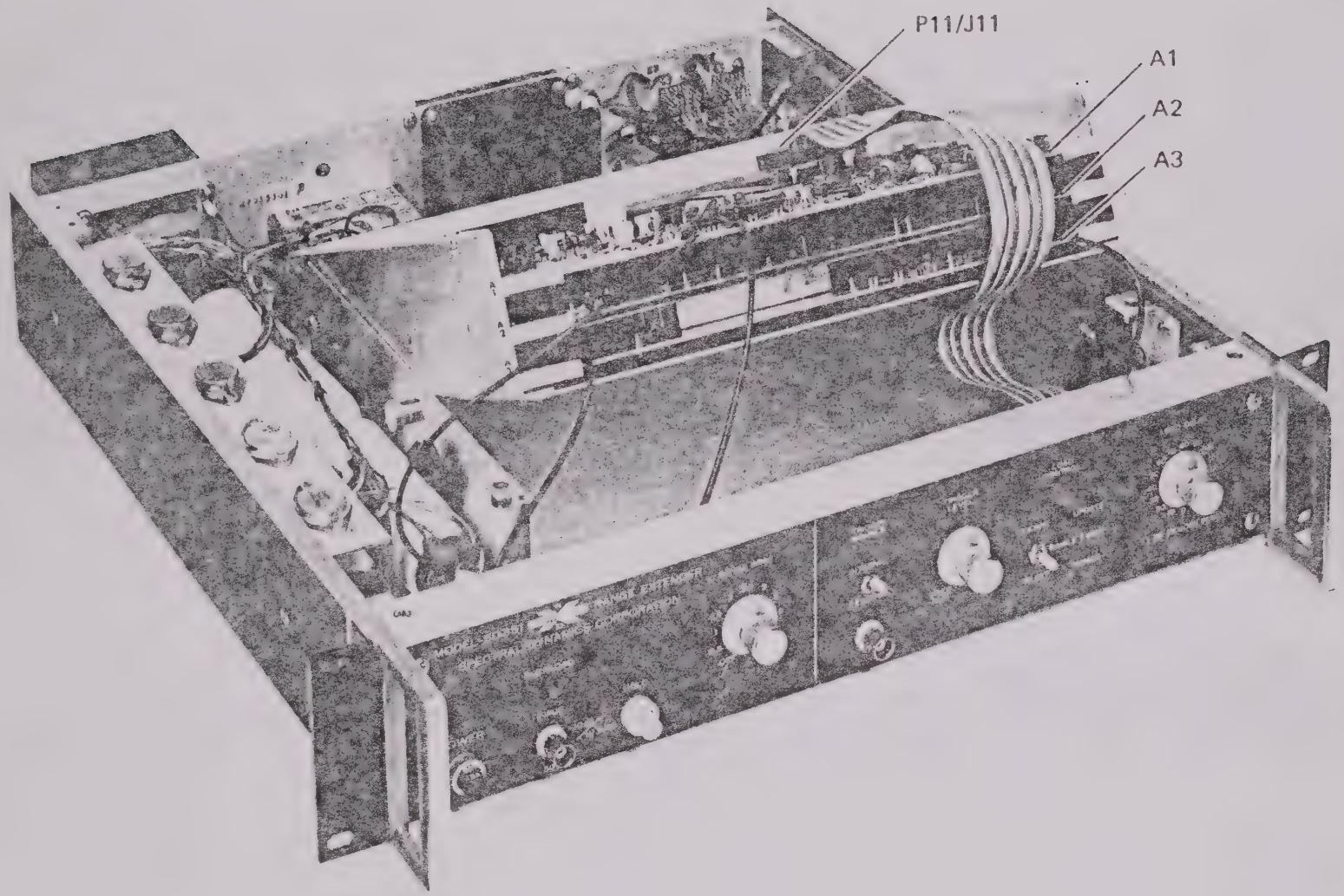
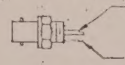


Figure 4-1. SD351 Service Access.

Table 4-1. Replaceable Parts and Assemblies

Reference Designator	Description	Part Number	Reference Designator	Description	Part Number
Ref.	Model SD351	27913500	S2/DS2	Switch Assembly (HOLD) Illuminated Marco -Oak PN 618-5-1, Type 345 Lamp	10529300
A1	PCA, A/D Converter	27914400			
A2	PCA, Memory	27914700			
A3	PCA, Anti-aliasing Filter	27915600			
B1	Fan, Axial, Rotron PN SP2A2	10533900	S3	Switch Assembly (RANGE MHz), Rotary	27946900
DS3,4,5	Indicator (OVERLOAD, RANGE OFF, and UP-DATE) LED, Monsanto PN MV5025	10535601	S4	Switch (TRIGGER SOURCE), Toggle, C & K Components PN 7101	10531700
DS6	Indicator (ARMED), LED, Monsanto PN MV5253	10612401	S5/R1	Switch Assembly (TRIGGER LEVEL), Potentiometer	27947300
J1,2	Connector, Multiplier, Elco PN 00-8026-075-491-801	10666801	S6	Switch (LOAD CONTROL), Toggle, C & K Components PN 7107	10531702
J3 thru J9	Connector, BNC, Amphenol PN 31-010	10657800	S7	Switch Assembly (LOAD DELAY), ROTARY	27947000
J10	Connector Assembly (POWER), Fused Filter, CORCOM PN GJ4	27736100	Ref.	Cable Assembly, SD351 to SD350-6 Interconnect	27988900
S1/DS1	Switch Assembly, (POWER) Illuminated Pushbutton, Type A1H Lamp	10139200	Ref.	Power Cord Assembly, Belden PN 17250	10567100



REV	ECO	SYM	DESCRIPTION	MAT	CHECK	APPD
A	-	-	RELEASED			
B	DDC	-	REVISED TO AS BUILT LEVEL			

TABLE I WIRE NUMBER FUNCTIONAL GROUP

1	X	X	TIMING AND CONTROL SIGNALS ORIGINATING FROM A2
2	X	X	2048 BUS BETWEEN UNITS OTHER THAN THOSE FROM A2
3	X	X	ADDRESS LINES
4	X	X	DIGITAL (DO) LINES
5	X	X	FRONT & REAR PANEL CONTROLS (DIGITAL)
6	X	X	REAR PANEL J1G AND SPARE SIGNALS
7	X	X	FRONT & REAR PANEL SIGNALS (ANALOG)
8	X	X	
9	X	X	POWER

TABLE II

	SIGNAL DIRECTION
S	SIGNAL SOURCE
D	SIGNAL DESTINATION
B	BI-DIRECTIONAL

TABLE III WIRE LEVEL

	LEVEL	(WIRE COLOR)	FUNCTION
1	LEVEL 1	(GREEN)	ADDRESS LINES
2	LEVEL 2	(BLUE)	DATA LINES (DIGITAL)
3	LEVEL 3	(WHITE)	CONTROL LINES
4	LEVEL 4	(RED)	FRONT REAR PNL I/O & CONTROL
5	LEVEL 5	COAX	ANALOG DATA LINES
A	LEVEL A	BUS STRIPS	PWR AND DATA BUS STRIPS TO BE INSTALLED PRIOR TO WIRE WRAP
B	LEVEL B	AS REQ'D	TO BE INSTALLED BY HAND AS FINAL ASSEMBLY

TABLE IV

	ACTIVE LOGIC LEVEL OR TRANSITION
H	HIGH LEVEL
L	LOW LEVEL
U	POSITIVE TRANSITION
D	NEGATIVE TRANSITION
B	BOTH POSITIVE & NEGATIVE TRANSITION OR LEVELS AS REQ'D BY BOARD CIRCUITRY
X	DOES NOT APPLY

TABLE V

	WIRE TYPE
W	WIRE WRAP
B	GOLD BUS STRIPS
C	COAX HOT
G	COAX GND
P	HAND WIRED TO WIRE-WRAP CLIPS & OR BUS STRIPS OR SOLDERED (AS REQ'D) USING 22 AWG WIRE
Q	22 GA WIRE SOLDERED (AS REQ'D)
S	SHIELDED CABLE (AS REQ'D)
T	PWR BUS BARS
Q	BRAIDED CABLE (AS REQ'D)

TYPICAL INTERCONNECT LISTING

CONNECTOR PIN	WIRE NAME	WIRE NO.	SPEC FIELD F	C	L	W	STRING LIST *
A01 A9B	A19FS	2046	D	3	X	W	* DELETED STRING LIST FOR 9040 THRU 9010

WIRE NO. 9011 THRU 9019
TO BE 18 AWG WIRES WITH CLEAR SLEEVING FOR THIS CABLE

1. BUNDLE WIRES OVER CENTER OF CARD-EDGE CONNECTORS TO ALLOW FREE AIR FLOW THROUGH SLOTS

NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
LINEAR .XX = ± .03 .XXX = ± .010
ANGULAR ± 0.30
DO NOT SCALE DRAWING
MATERIAL
FINISH

SPECTRAL DYNAMICS CORPORATION OF SAN DIEGO

DRAWN T. D. Gross 1/73
DESIGNER
CHECKED
ENGINEER
APPROVED
SCALE —

TITLE
INTERCONNECT
MODEL SD351

MODEL	SIZE	DRAWING NO.	REV
SD351	D	27914B	B

SHEET 1 OF 13

MP MASTER
MA29873